

Resuscitation Training Department

Basic Life Support
&
Defibrillation familiarisation

Work Book

Resuscitation Training Department

Aim of this resource work book

- Recognise and manage the patient in a cardiac arrest before the cardiac arrest team arrive.
- Maintain high quality chest compressions with minimal interruptions.
- Modify adult resuscitation so that it may be used to resuscitate a child.
- Management of a patient who is choking.
- Use of the Lateral Position (recovery position).
- Defibrillation safety.
- Recognition of the deteriorating patient using ABCDE assessment.

BASIC LIFE SUPPORT

The purpose of Basic Life Support (often abbreviated to BLS or CPR) is to provide adequate breathing with artificial ventilation and support the work of the heart with chest compressions. When an individual stops breathing, brain damage due to lack of oxygen can occur within three minutes. Good Basic Life Support should delay the onset of this damage. 2015 Resuscitation Council (UK) guidelines emphasise the importance of good quality chest compressions with minimal interruptions and early safe defibrillation.

Safety

Basic life support starts with a safety assessment of the environment, with the aim of minimising the risks to the rescuer and reducing further harm to the person. In hospital such risks could be fluids on the floor. It is important to protect yourself with the appropriate personal protective equipment.

Response

Upon finding a patient, assess their responsiveness by gently tapping them on their shoulders and asking '**Are you all right?**'



If the patient does not respond shout for help and/or pull the emergency buzzer.

Airway

Airway is the term used to describe the route air takes from the outside to the point where it is used in the lungs. Attending to the airway is the first priority in the collapsed patient. Prior to opening the airway, look in the patient's mouth to check for fluids. If fluids are seen, either suction the mouth or turn the patient's head to one side to let gravity drain the fluid from the mouth.

In the unconscious patient relaxation of the tongue, neck and muscles of the throat may cause obstruction of the airway. This may be corrected by using the **head tilt chin lift** manoeuvre. Place your hand on the forehead of the patient and gently tip their head back. Simultaneously place two fingers of the other hand under the tip of the patient's chin and lift the chin.



Breathing

To assess whether a patient is breathing, place your cheek close to the patient's mouth whilst maintaining the head tilt chin lift manoeuvre. **Look** for any signs of breathing/chest movement, **Listen** at the patient's mouth for any breath sounds and **Feel** for breath on your cheek for no longer than 10 seconds.



If the patient is breathing **normally** then place them in the lateral position (on their side). If they are not breathing **normally** or you are in doubt act as if breathing is not normal and commence **Chest Compressions**. In the opening few minutes of a cardiac arrest the patient may be barely breathing, or taking infrequent noisy gasps (known as agonal breathing), this does not constitute normal breathing.

Summoning Help/Activation of the Cardiac Arrest Team

2222 Cardiac Arrest Team

In hospital, as soon as it has been established that the patient is not breathing, the cardiac arrest team must be summoned. To call the cardiac arrest team dial **2222** on any internal phone. Switchboard will answer your call immediately. Then state:

‘Cardiac Arrest’, ‘Location’ and ‘Adult or Child’

- Do not use abbreviations to describe your location
- Wait for switchboard to confirm that they have understood the request before putting the phone down.

Chest Compressions

The reason chest compressions are started first is that in the majority of cardiac arrests the blood oxygen content remains high. Therefore, ventilation is less important at this time.

In hospital it is vital to expose the patient's bare chest to enable correct hand positioning for chest compressions and correct placement of defibrillation pads when available. Hands should be placed in the middle of the lower half of the sternum, **centre of the chest** as shown below.



To deliver effective chest compressions, place the heel of one hand in the centre of the patient's chest and place the heel of the other hand on top, interlock the fingers of both hands and lift the interlocked fingers so that pressure is not applied over the patient's ribs.

Position yourself vertically over the patient's chest, and with your arms straight, push down 5-6 cm. Release the pressure between each compression so that the heart can fill with blood, and repeat at a rate of 100-120 compressions per minute (approximately 2 per second). When a device is available to ventilate the patient's lungs, a ratio of 30 chest compressions to every 2 breaths can be delivered. If there is no device to deliver ventilation, continue with continuous chest compressions.

Chest compressions are tiring. If possible the person performing chest compressions should plan to swap with another member of staff every 1-2 minutes to prevent fatigue and avoid delivering poor chest compressions. Plan these changes in advance to ensure time off the chest is kept to a minimum.

Ventilation

In hospital, staff should not attempt mouth to mouth ventilation.

Bag Valve Mask Ventilation (BVM)

A bag valve mask is available on each cardiac arrest trolley and in each grab bag. A bag valve mask is capable of delivering between 85 -90% oxygen to a patient. BVM ventilation is a two person technique; one member of staff seals the mask on to the patient's face whilst the second member of staff squeezes the bag enough to see a normal chest rise. To ensure a good seal is gained between the mask and the patient's face, place the mask over the face (pointed part across the bridge of the nose), gently push the mask on to the face and bring the jaw up into the mask, as shown in the picture below.



As shown in the picture the BVM has oxygen tubing which should be attached to 15L of oxygen for maximum delivery of oxygen to the patient's lungs. The use of one hand depressing the bag should be sufficient to produce a normal chest rise as demonstrated in the picture. The 2 breaths that you deliver should take no longer than 3 seconds to deliver.

Pocket Mask

A pocket mask is sealed on to the patient's face in the same way a BVM is used. A pocket mask can be used by one member of staff and is capable of delivering between 45-50% oxygen when oxygen is entrained to the mask. Breathe into the mask for 1 second, delivering enough breath to see a normal chest rise. Then move your mouth away from the mask and let the chest fall. Deliver a maximum of 2 breaths and avoid rapid or forceful breaths.

When using a BVM or pocket mask do not attempt any more than 2 breaths. If the chest does not rise, check that you have a good seal whilst compressions are restarted.

In a cardiac arrest once ventilation has been established, a ratio of 30:2 compressions/ventilations should be maintained. Stop and recheck the patient only if they show obvious 'signs of life': otherwise **do not interrupt resuscitation**.

Defibrillation

After basic life support has been established the next priority is defibrillation. All clinical areas within the hospital have access to a defibrillator.

Resuscitation of children (paediatric modifications)

Staff that do not have a direct responsibility for the care of sick children are taught a modified version of adult resuscitation that is suitable for use in the resuscitation of children.

- In hospital initiate a 2222 call immediately.
- Deliver five initial breaths before starting chest compressions. Then use the adult ratio of compressions/ventilations 30:2.
- During compressions compress the chest by at least one third. This is approximately 4cm for infants and 5cm for a child over 1. An adequate compression will require the use of 2 fingers for infants and 1 hand (2 if necessary) in a child over 1.

Choking

Most adults will usually be able to expel something they are choking on by coughing. However, if they are unable to do so, further intervention is required. There are two techniques for relieving an airway obstruction in an adult who is actively choking.

If the patient is conscious and breathing, but is obviously choking:

- Encourage the patient to continue to cough.

If the patient shows signs of exhaustion i.e. a weak cough, cyanosis or is having problems breathing, but is still conscious:

- Carry out up to 5 back blows.
- If the obstruction is not relieved by back blows, deliver up to 5 abdominal thrusts.
- Continue with the above sequence alternating between back blows and abdominal thrusts until the obstruction is expelled or the patient loses consciousness.
- If the patient loses consciousness start a BLS assessment.
- Call the Cardiac Arrest Team if two cycles of blows and thrusts do not relieve the obstruction.

Performing Back Blows

- Ensure any obvious obstruction in the mouth is removed.
- Inform the patient of what you are about to do.
- Stand beside the patient, lean them forward whilst supporting their chest with one hand.
- Deliver up to 5 sharp blows between the shoulder blades, using the heel of one hand.



Performing Abdominal Thrusts

- Inform the patient of what you are about to do.
- Stand behind the patient, whether he/she is sitting or standing.
- Put both arms around the patient's abdomen, leaning the patient forward.
- Clench one hand into a fist and place it between the umbilicus (belly button) and the xiphisternum (bottom tip of the breastbone) and grasp the fist with your other hand.
- Pull sharply, inwards and upwards.
- Deliver up to 5 abdominal thrusts.



Lateral Position (recovery position)

- A patient with a reduced level of consciousness should be nursed in the lateral position to **protect their airway**.
- The lateral position (formerly known as the recovery position) is achieved by placing a patient safely on to their side, with the patient's head in a '**chin up**' position (shown in picture below).
- The lateral position can be used on most patients' whom **do not** have any risk of cervical spine injury.



Defibrillation

Learning Outcome

- To safely deliver a shock using an Automated External Defibrillator (AED).

The shorter the interval between the onset of a shockable rhythm and defibrillation is, the greater the chances of survival for a patient. For every minute that defibrillation is delayed the chance of survival falls by 7-10%. AED's are programmed to recognise the cardiac rhythm and prompt the user accordingly.



LIFEPAK 1000 AED

Sequence for using the Defibrillator

Ensure CPR is ongoing.

Turn the machine on. The machine will say:

'CONNECT ELECTRODES' - Attach pads to the patient's bare chest (in the positions shown on each pad).

The machine will then prompt everyone to **'STAND CLEAR'** whilst it is analysing the cardiac arrest rhythm.

The machine will at this point say either:

'NO SHOCK ADVISED' - **Non shockable** cardiac arrest rhythms (asystole/pulseless electrical activity) do not require defibrillation, CPR should be recommenced for 2 minutes.

or

'START CPR' - **Shockable** cardiac arrest rhythms (ventricular fibrillation/pulseless ventricular tachycardia- VF/VT) require defibrillation. If the AED states 'Start CPR' a 15 second countdown clock will appear on the screen, indicating defibrillation is required.

During the 15 second countdown the machine is internally charging so that when the

countdown reaches 0 the machine is fully charged and ready to discharge the shock.

Time off the patient's chest has been shown to be detrimental to survival of patients during a cardiac arrest, and current guidance recommends that staff continue with chest compressions whilst the AED is internally charging.

To enable this to happen safely the following instructions should be adhered to:

- Machine states '**START CPR**'. The 15 second countdown clock appears on AED Screen.
- AED operator instructs a member of staff to "**continue with chest compressions only**".
- AED operator instructs all other staff to "**stand clear**".
- Countdown clock reaches 0 and AED states '**SHOCK ADVISED, STAND CLEAR, PUSH SHOCK BUTTON**'.
- AED operator instructs the staff member carrying out chest compressions to "**stand clear**" and then if it is still safe to do so push the shock button and deliver the shock.
- Defibrillation should immediately be followed by CPR for 2 minutes.

Defibrillation Safety

The defibrillator in AED mode will not deliver a shock inappropriately to a patient. The defibrillator operator needs to ensure that those present remain safe during the defibrillation process.

Before delivering a shock to a patient ensure;

- No direct contact is being made with the patient.
- No indirect contact is being made with the patient (touching the end of the bed).
- Oxygen is at least 1 metre away from the patient's chest.
- There is no metal on the patient's chest.
- There are no fluids on the patient's chest or that the patient is not laying in any fluid that staff could stand.

Recognition of the Deteriorating Patient and Prevention of Cardiorespiratory Arrest

Less than 20% of patients having an in hospital cardiac arrest will survive to hospital discharge. Many in-hospital cardiac arrests are predictable, with approximately 80% of cases showing clinical signs and symptoms of deterioration some hours before they arrest.

Early recognition of the deteriorating patient may;

- Prevent cardiac arrest/death.
- Prevent unplanned admissions to critical care environments.
- Help identify patients for whom cardiopulmonary resuscitation is not appropriate.

When assessing all deteriorating or critically ill patients, a standardized A to E approach/assessment should be used. The following guide to carrying out an A to E assessment is not exhaustive and staff should work to their own level of competence and confidence.

The A to E assessment should include the following;

- A complete initial assessment of the patient and re-assessment
- Treatment of life threatening problems before moving on with the assessment
- Calling for help early, escalate care according to the Clinical Response to NEWS2 triggers outline

Airway

Assess

- Is the patients' airway patent, at risk or obstructed?

Treatment

- If a patient is able to talk, this suggests their airway is patent.
- Suction any fluids in the airway.
- Employ a head tilt/chin lift or jaw thrust manoeuvre to open an airway that is at risk. Simple airway adjuncts may be used to maintain airway patency.

Breathing

Assess

- Respiratory Rate
- Oxygen Saturation level
- Work of breathing

Treatment

- Give oxygen to meet target saturations
- Nebulizer therapy if appropriate
- Bag Valve Mask ventilation if required
- Repositioning of the patient

Circulation

Assess

- Manual palpation of pulse
- Manual measurement of blood pressure
- Capillary refill Time
- ECG if appropriate

Treatment

- IV/IO access
- IV fluid bolus if appropriate
- Treat the cause e.g. apply pressure to a bleeding wound

Disability (neurological status)

Assess

- Conscious level using ACVPU or GCS
- Pupil size/reaction if appropriate
- Measurement of capillary blood glucose (to be measured in any patient with a reduced level consciousness)
- Check the drug chart

Treatment

- If able to do so place the patient in the lateral position
- Treat hypoglycaemia

Exposure

Assess

- Temperature
- Whilst maintaining the dignity of a patient assess them from 'top to toe'

Treatment

- Treatment depends upon your findings. Avoid unnecessary heat loss and maintain dignity.

Summary

The management of a patient in an emergency situation represents a considerable challenge to the rescuer. The skills that are covered in this resource should be practised on a yearly basis to retain the knowledge and skills required.

The Trust's Cardiac Arrest Policy and Do not Attempt Resuscitation Policy can be found on the intranet under Resuscitation Training.

ADULT BASIC LIFE SUPPORT MCQ
PLEASE RECORD ANSWERS ON THE GRID
PROVIDED ON PAGE 21

1. The following indicates a cardiac arrest and the need for Basic Life Support:

- A. Any unconscious patient.
- B. Occasional gasps in a patient who is unconscious and unresponsive.
- C. Purposeful movements and eye opening.
- D. Normal breathing in an unresponsive patient.

2. The correct sequence for Adult Basic Life Support is:

- A. Safety, response, check and open airway, check breathing, deliver breaths, check circulation, deliver chest compressions.
- B. Response, safety, airway, check breathing, check circulation, deliver chest compressions.
- C. Safety, response, check and open airway, check breathing, call for the cardiac arrest team, start chest compressions.
- D. Checking breathing, check circulation, deliver breaths, deliver chest compressions.

3. During Basic Life Support:

- A. A ratio of 2 ventilations to 30 cardiac compressions is correct.
- B. Hands should be placed in the middle of the lower half of the sternum.
- C. Chest compressions should be 5-6 cm deep at a rate of 100-120 compressions per minute.
- D. Ventilations should be given before chest compressions when starting CPR.

4. Summoning Help/Activation of the Cardiac Arrest Team

- A. To summon the cardiac arrest team dial 3333.
- B. State whether the patient is male or female.
- C. Do not use abbreviations for the ward area you are in.
- D. Wait for switchboard to confirm they have understood your request before putting the telephone down.

5. Breathing and Ventilation

- A. During a BLS assessment, breathing should be checked for no longer than 10 seconds, whilst maintaining a head tilt/chin lift.
- B. Use of a BVM is a 2 person technique.
- C. The BVM always requires two hands to squeeze it to produce a sufficient chest rise.
- D. The BVM oxygen tubing should be attached to 15L of oxygen.

6. Resuscitation of Children (paediatric modifications)

- A. The adult BLS sequence for resuscitation can be used for children with some modifications.
- B. Child resuscitation starts with 2 initial breaths before starting chest compressions.
- C. Compressions on a child above 1 should depress the chest by approx. 5cm.
- D. Help via a 2222 call should be summoned immediately.

7. Choking

- A. If a patient is conscious and breathing, but is obviously choking, encourage them to cough.
- B. If the patient loses consciousness, lay them on their side.
- C. If the patient is showing signs of exhaustion, deliver 5 back blows then deliver 5 abdominal thrusts if the obstruction is not expelled.
- D. Wait until the patient loses consciousness before calling the Cardiac Arrest Team.

8. The Lateral Position

- A. The lateral position can be used in most unconscious patients.
- B. The patient should be placed safely on to their side with their head in 'chin up' position.
- C. The use of the lateral position helps to protect a patient's airway.
- D. The lateral position should not be used if a patient has a cervical spine injury.

9. Defibrillation

- A. When delivering a shock, ensure there is no direct or indirect contact made between the patient and anyone else.
- B. At the point of defibrillation, continue chest compressions and ventilations.
- C. Ensure oxygen is at least 1 metre away from the patient's chest when defibrillating.
- D. All members apart from the person performing chest compressions should stand clear whilst the defibrillator charges.

10. Recognition of the deteriorating patient

- A. May improve patient survival.
- B. In approximately 30% of cardiac arrests, patients show signs and symptoms of deterioration prior to the cardiac arrest.
- C. When assessing a patient using A to E, airway is always assessed first.
- D. ABCDE is the recommended framework to assess all critically ill patients.

Recognition of the deteriorating patient continued

11. You are giving a bedside handover of your patient when they suddenly appear pale and clammy.

Your **first** priority in the management of this patient is to:

- A. Record an ECG.
- B. Check pulse and blood pressure.
- C. Assess airway, breathing, circulation, disability and exposure.
- D. Bleep the consultant immediately.

12. **SBAR** stands for:

- A. Scene, Breathing, Airway, Response.
- B. Status, Blood, Air, Recognition.
- C. Situation, Background, Assessment, Recommendation.
- D. Suggestion, Backdrop, Actions, React.

13. Following completion of the Sepsis screening tool your patient has one or more Red flags present, your appropriate action would be:

- A. Ensure you give IVAB within 24 hours
- B. Give IVAB, give IV fluids, commence cardiac monitoring and escalate to Rapid Response.
- C. Perform urinalysis
- D. Give Oxygen, Give IV Fluids, Give IVAB, Take blood cultures, take serial lactates, measure urine output.

ADULT BASIC LIFE SUPPORT Multiple Choice Questionnaire

Mark each question either TRUE or FALSE

Q	TRUE	FALSE	Q	TRUE	FALSE
1A			8A		
1B			8B		
1C			8C		
1D			8D		
Q	TRUE	FALSE	Q	TRUE	FALSE
2A			9A		
2B			9B		
2C			9C		
2D			9D		
Q	TRUE	FALSE	Q	TRUE	FALSE
3A			10A		
3B			10B		
3C			10C		
3D			10D		
Q	TRUE	FALSE	Q	TRUE	FALSE
4A			11A		
4B			11B		
4C			11C		
4D			11D		
Q	TRUE	FALSE	Q	TRUE	FALSE
5A			12A		
5B			12B		
5C			12C		
5D			12D		
Q	TRUE	FALSE	Q	TRUE	FALSE
6A			13A		
6B			13B		
6C			13C		
6D			13D		
Q	TRUE	FALSE			
7A					
7B					
7C					
7D					